MSD Benchmarking Assessment

November 2013

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Executive Summary

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Executive Summary

Metropolitan Sewer District of Greater Cincinnati (MSD) is among the top 5 Combined Sewer Overflow (CSO) dischargers in the country, discharging approximately 11.4-billion gallons of overflow during a typical year of rainfall. MSD is implementing an integrated, watershed based approach to reducing CSO volume that improves the water quality in the streams and rivers in its service area. MSD is under a significant consent order, requiring it to manage its combined sewer overflow that is estimated around 11.4 billion gallons during a typical year of rainfall. To comply with these regulations, major capital investments are required to be in compliance with the consent decree, and at the same time, MSD must continue to manage the day to day operations in the most effective and efficient way. The large capital budget required by MSD to make these improvements is estimated at $3.0 billion, increasing stakeholder's interest in MSD performance management to insure this large investment is wisely administered.

Federally driven mandates create a unique set of circumstances for the utility – balancing wet weather improvements against the need to maintain existing structures and facilities; expansion of systems and processes to meet new and higher levels of output and expectations; managing sewer revenue in light of potential rate payer fatigue. While there are many specialized self assessment and benchmarking tools within the industry, there is no such assessment tool that integrates and addresses the unique challenges of CSO communities. Gaining agreement among the "5 Cities" utilities , Mr. Parrott established that MSD would take the lead in developing a new comprehensive self assessment utility benchmarking tool that could be piloted at MSD and then refined to be utilized by Five Cities and other utilities as desired. This approach allowed for a speedy path to address MSD's immediate needs while also addressing the greater needs of other potential partners.

MSD commissioned CH2M HILL to develop a self assessment benchmarking tool to include elements that are necessary to meet and address consent decree requirements; watershed based practices, regulatory practices, financial/affordability constraints, and sustainability. It included both metric and practice measurement. The consultant team developed the assessment tool in early 2013, with MSD subsequently piloting the tool.

The approach for this project was to develop a framework that sets an industry standard for consent decree utilities and a benchmarking assessment tool that could be recognized, used, and adopted as an industry standard. The aim of the tool is three-fold:

▸ To help utilities deal more strategically and cost effectively with regulators to manage consent orders

▸ Assist in assessing the status of performance and utility management practices, as well as areas for improvement

▸ To provide context for stakeholders to measure the utility against a set of peers

The basic process for the tool development was to review industry knowledge to compile a comprehensive framework and tool that assesses organizational practices qualitatively through measures and quantitatively through metrics. Building on industry knowledge, the tool is cohesive and relevant to existing standards; however gaps were filled with new practices and measures that addressed consent issues not yet dealt with by the industry. The framework and tool were reviewed by MSD staff, and comments were incorporated. MSD piloted the benchmarking tool in June and July of 2013, identifying areas of organizational strength and areas for improvement. This assessment results will serve as a baseline for performance that can be monitored, measured and improved over time for MSD. The pilot exercise also led to suggested improvements and finalization of the benchmarking tool.

Throughout the course of the assessment tool development, steps were taken to set the stage with other utilities and various industry organizations to engage in future benchmarking and procure industry wide acceptance.

Benchmarking Self Assessment Overview

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Purpose & Objectives of Assessment Tool

Purpose

▸ Measure compliance & performance

▸ Negotiate consent decree

▸ Allow more capabilities for utilities to manage consent decree with outcomes, projects, and BMPs

Objectives

▸ Create capability to deal more strategically and cost effectively with the Regulators to represent Cincinnati's interests

▸ Develop a concept model with supporting practices and tools that are consistent with goals of consent decree communities

▸ Help consent decree utilities to prioritize the right investments

▸ Help consent decree utilities define the pace of improvements (affordability)

Approach to Develop the Assessment Tool

The approach to developing this tool can be summarized in the following steps:

1. Various industry benchmarking tools and leading practices databases were identified through the literature review process.

2. The identified benchmarking tools and leading practice databases were evaluated for framework and content.

3. Specific benchmarking tools and leading practices were selected for use in developing the benchmarking tool.

4. Based on the literature review, a draft benchmarking tool framework was developed.

5. The draft benchmarking tool framework was reviewed by MSD and updated to reflect review comments.

6. Once the framework was finalized, specific practices, definitions, measures, metrics, and a scoring system were identified using the literature review as a foundation.

7. The draft practices, definitions, measures, metrics, and scoring system were reviewed by MSD and updated to reflect review comments.

8. The draft benchmarking tool was compiled and formatted and presented to MSD in a pilot training workshop.

9. MSD conducted a pilot self assessment using the draft benchmarking tool through teams to collect data.

10. Data from the self assessment was compiled into the draft benchmarking tool to provide results to MSD on their organizational strengths and areas for improvement, as well as specific improvement recommendations.

11. Benchmarking tool feedback from the self assessment was incorporated into a final benchmarking tool.

12. Industry associations, future funding partners, and other utilities were engaged in order to facilitate the future use of the benchmarking tool and to garner future utility participation with the goal of having the benchmarking tool recognized, accepted, validated, enhanced and supported by the wastewater industry, including regulators.

The guiding principles' for development:

▸ Build off the existing industry literature and best practice where possible

▸ Develop an assessment that can be recognized, used, and adopted as an industry and regulatory tool

▸ Housed and managed by an industry organization (EPA, non-profit that works on behalf of multiple utility or orgs, or research association)

▸ Audit/validation?

▸ Pilot the tool with MSD with the intention of offering to other utilities in next phase

▸ Do nothing that is inconsistent with finding (long term) an organization that houses the maintenance of the tool

Terms

Acronyms & Abbreviations

- AMWA – Association of Metropolitan Water Agencies
- AWWA – American Water Works Association
- APWA – American Public Works Association
- ASCE – American Society of Civil Engineers
- CSO – Combined sewer overflow
- EPA – United States Environmental Protection Agency
- EWRI – Environmental and Water Resource Institute of the American Society of Civil Engineers
- FHA – Federal Highway Administration
- GFOA – Government Finance Officers Association
- IWA – International Water Association

- Kwh – Kilowatt hours
- MGD – Million gallons per day
- MG – Million gallons
- NACWA – National Association of Clean Water Agencies
- NAWC – National Association of Water Companies
- NSF – National Science Foundation
- TBL – Triple bottom line
- TMDL – Total maximum daily load
- WaterRF – Water Research Foundation
- WEF – Water Environment Federation
- WERF – Water Environment Research Foundation
- WSAA – Water Services Association of Australia

Definitions

- Benchmarking: "Benchmarking is a tool for performance improvement through systematic search and adaptation of leading practices" (Cabrera, Enrique, Jr., Peter Dane, Scott Haskins, and Heimo Theuretzbacher-Fritz. Benchmarking Water Services. American Water Works Association. 2011).
- Category: A division within a system of classification
- Subcategory: Subordinate parts to a category
- Practice: Professional activities that are carried out, applied, and measured quantitatively.
- Metric: An indicator that has a standard of measurement.

# Tool Development

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Literature Review

▸ In order to develop a benchmarking tool that is robust and built upon industry knowledge, a list of well accepted benchmarking tools and best practice databases that span across the field of utility management were identified. This list is presented below:

Benchmarking Tools and Best Practices Databases

Literature/Tool	Publishing Organization	Focus
Aquamark	WSAA and IWA	Asset management tool
Financial Survey	NACWA	Financial data and comparisons
Stormwater Menu of BMPs	USEPA	Stormwater best management practices online resource
Core Attributes of Effectively Managed Wastewater Collection Systems	APWA, NAWC, NACWA, WEF, AWWA, AMWA	Utility management guidance document
QualServe Benchmarking	AWWA, WEF	Performance metrics
SAM Gap Analysis tool	WERF	Asset management practices
Simple- Sustainable Infrastructure Management Program Learning Environment	WEFR	Sustainability guidance
Triple Bottom Line Reporting for Water Utility	AWWA	Asset management and financial evaluation
Effective Utility Management	NACWA, WEF, AWWA, AMWA, APWA, NAWC	Attributes of effectively managed utilities
Wastewater Sustainability Reporting Indicators	WEF	Utility metrics guidance
Planning for Sustainability	EPA	Sustainability guidance document
Best Practices in Public Budgeting	GROA	Financial online resource
2011 NACWA Financial Survey	NACWA	Financial guidance document
Enhancement of QualServe Tools to Improve Utility Operations	AWWA and WRF	Utility management guidance document
SAM-GAP	WERF	Asset management online tool
Sustainable Infrastructure Management Program Learning Environment (SIMPLE)	WERF and WaterRF	Asset management online resource
Triple Bottom Line	AWWA	
Water EUM	AMWA, APWA, AWWA, WEF, EPA, NACWA, NAWC	Effective Utility Management online resource
Wastewater Sustainability Reporting Indicators	WERF	Guidelines and indicators for sustainability
WateriD	Virginia Tech, WERF, EPA, NSF AWWA, IWA	Water Infrastructure database
Benchmarking Water Services. (2011)		Benchmarking methodology manual
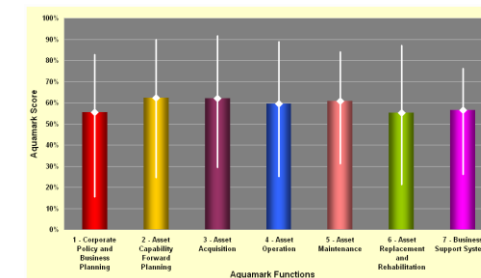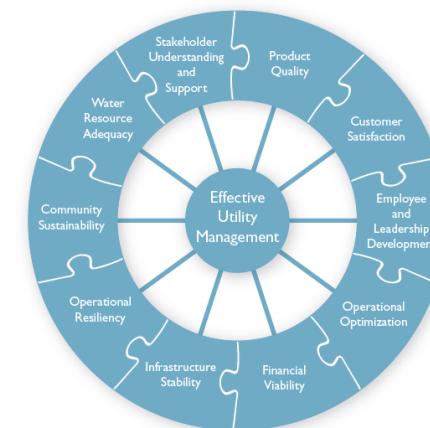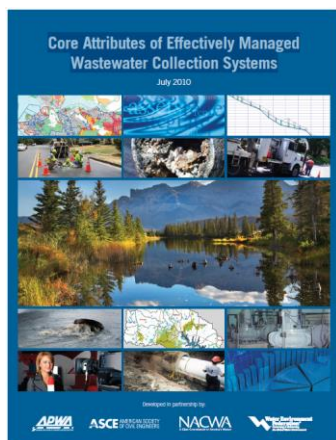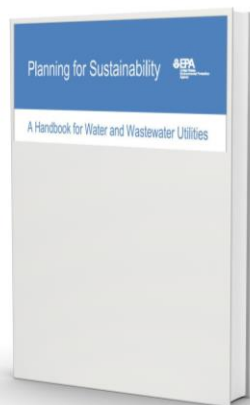
Framework

Based on the literature review and evaluation of the various components, frameworks, organizational approaches, etc., a draft framework was compiled that comprehensively addressed a utility organization. The framework was organized by category, subcategory, practice, measures and metrics. To assess performance, measures are measured qualitatively. Metrics are measured quantitatively through a mathematical formula. Specific categories, subcategories, and practices were identified, evaluated, reviewed, and finalized based on discussion with MSD. Once the framework was finalized, measures from the various literature review sources were mapped to a specific category, subcategory, and practice. Metrics were mapped directly to categories.

This self assessment tool was piloted by MSD to conduct their self assessment. Data collection for metrics was conducted for 2012 actuals. Some additional metrics were identified to start baselining in 2013 for future assessments. A similar approach was used to develop the scoring mechanism for these measures and metrics. Metrics are measured quantitatively, and therefore mathematical formulas were developed for each metric using literature review sources. In addition, there were two qualitative components (data quality, effectiveness) to each metric measured on qualitative scoring system.

6 Categories, 28 Sub-categories

Infrastructure	Operations	Maintenance	Organization	People	Environment
Planning Policies and Procedures	Collections	Collections	Financial Management	Workforce	Regulatory Compliance
Design	Treatment	Treatment	Risk Management	Health and Safety	Water Quality
Construction	Stormwater/Watershed	Stormwater/Watershed	Strategic/Business Planning	Stakeholder Management	Land Management
Asset Management Knowledge/System			Legal	Communication	Environmental Management
			Quality		
			TBL Policy & Reporting		
			Enterprise Document Management		
			Security		
			IT		
			Procurement		

Framework Definitions

The benchmark self assessment tool has six categories that span all utility functions

Infrastructure
All elements pertaining to asset knowledge and lifecycle, from planning through decommissioning, with the exception of operations and maintenance. Assets include all infrastructure, moving stock, fleet, equipment, IT and other supporting items.

Operations
All elements pertaining to the operation of the system, from pretreatment through disposal, as well as compliance. Includes all operational modes, such as standard and emergency conditions.

Maintenance
All elements pertaining to the maintenance of the system, from pretreatment through disposal.

People
All elements pertaining to people interacting with a utility including employees, customers, and stakeholders.

Organization
All elements pertaining to the functions and processes of the utility.

Environment
All elements pertaining to the natural environment and its interactions including living and non-living things occurring naturally including all vegetation, microorganisms, soil, rocks, air, water, climate, energy, etc.

Practice & Measure: Qualitative Scoring Method

The scoring system for the measures is qualitative and composed of three components – Documentation, Application, and Effectiveness – which are scored from 1 to 5 based on the description for each. Documentation addresses how well the measure is documented. Application addresses how widely spread is the use of the measure. Effectiveness addresses how effective is the measure. For the purposes of the pilot only, Usefulness was assessed for each measure, as well as any comments. Usefulness was scored from 1 to 5, a score of 1 being a functional practice of a wastewater utility regardless of combined sewer overflow (CSO) or consent decree characteristics, a score of 2 being mid-range CSO or consent decree characteristics, and a score of 5 being high priority CSO or consent decree characteristics. The scores from all three components are averaged to provide an overall score. The higher the score, the better the performance as related to that measure.

Scoring						
Practices		1	2	3	4	5
Documentation		None	Minimal, Partially defined 25%-50%	Moderate, Structured but not comprehensive defined, 50%-75%	Advanced, Substantially complete 75%-100%	Complete, Fully defined and understood 100%
Application		Spars, use is uncommon and isolated	Limited, use is applied in many relevant areas, 25%-50%	Moderate, use is intermittently applied in relevant areas, 50%-75%	Predominant, use is mostly applied in relevant areas, 75%-100%	Total, use is applied in all relevant areas, 100%
Effectiveness		Rarely, defined outcomes achieved in few relevant areas	Occasionally, defined outcomes achieved in many relevant areas, 25%-50%	Often, defined outcomes achieved intermittently relevant areas, 50%-75%	Usually, defined outcomes achieved in most relevant areas, 75%-100%	Always, defined outcomes achieved in all relevant areas, 100%

Practice & Measure: Qualitative

The overall framework for the benchmarking tool is comprised of a hierarchy of categories, subcategories, and practices. Categories are further divided into subcategories, and subcategories are further divided into practices. Each practice has one or more measures, which qualitatively assess performance.

Example: Infrastructure

Subcategory	Practice	Measure	Documentation	Application	Effectiveness	Total Score	Usefulness	Comment
Planning		Planning takes into account future changes that need to be made to accommodate growth, regulatory and management (organizational values) changes, and technology while meeting levels of service, and measures the performance of the agency. Changes can include both asset and non asset solutions to provide the greatest flexibility such that the optimal solution can be selected to reduce costs and other penalties.						
Planning Policies and Procedures		Principles or rules to guide decisions and achieve rational outcomes as they pertain to planning. Political, management, financial, and administrative mechanisms arranged to reach planning goal, organizational values, and levels of service. Includes support documentation that describes Who, What, Where, When and Why to establish accountability in support of the Implementation of the planning policy.						
		The agency assigns accountabilities and responsibilities for planning policy and procedure documentation, implementation and continual improvement and links planning data and roles and responsibilities through a framework.	3	3	3	3	Not rated	Define end of planning

Metrics: Quantitative Scoring Method

The scoring system for metrics is composed of two parts. The first is quantitative and is the actual calculation of the metric based on the mathematical formula, as shown in Table 6, and a target value for the metric. The target is the value that the utility is seeking to achieve. The second part is qualitative and comprised of Data Quality and Effectiveness, which are scored from 1 to 5. For the purposes of the pilot only, Usefulness was assessed for each metric, as well as any comments. An owner was assigned for the data collection required for completing the metrics portion of the benchmarking self assessment.

Metrics	Scoring	1	2	3	4	5
Data Quality		Metric data not tracked, not available	Estimated and 25% accuracy and completeness	Partly tracked, 50%-75% accuracy	Mostly tracked, 75%-100% accuracy	Fully documented, system generated, regularly recorded, auditable, comprehensive
Effectiveness		No performance target developed, non compliant	Objectives achieved 25%-50%	Objectives achieved 50%-75%	Objectives achieved 75%-100%	Aggressive performance targets set, strong achievements, regularly recoded and auditable

Metrics: Quantitative

Each category is also comprised of numerous metrics, which quantitatively assess performance. The Metrics are complied from the same literature sources as the practices. They are mapped to the main practice categories and tailored down into a core set of metrics. MSD conducted an internal review and provided comments, suggestion, proposed new measures, and ultimately provided 2012 actual data and performance targets for each metric. There is a scoring system based on three components for measures, and mathematical formulas and the two part scoring system based on data quality & effectiveness.

Example: Infrastructure

Metric	Formula	2012 Actuals	2012 Target	Performance	Quality	Effectiveness
Cash Reserve (Days)	Undesignated Cash Reserve Dollars/(Annual O&M Budget/365)	$213.43	$180.00	I	5	5
Modeling: % of constructed system in Model	• Modeling: % of system updated calibration over the last 5 years • Modeling: % of constructed system that is modeled, regularly calibrated and validated • Modeling: % of sanitary system that is modeled, regularly calibrated and validated conveyance system in model • Modeling: % of combined system that is modeled, regularly calibrated and validated	85%	93%	I	4.25	4.25

Self Assessment Results: Infrastructure

Infrastructure Definitions

Infrastructure—All elements pertaining to asset knowledge and lifecycle, from planning through decommissioning, with the exception of operations and maintenance. Assets include all infrastructure, moving stock, fleet, equipment, IT and other supporting items.
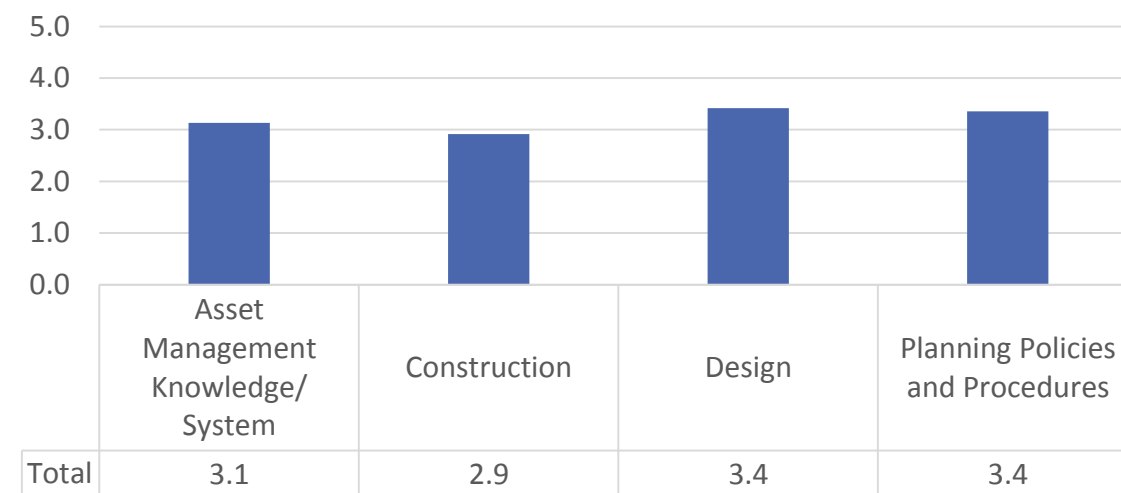
Subcategory	Definition
Infrastructure	
Planning	Planning takes into account future changes that need to be made to accommodate growth, regulatory and management changes, and technology while meeting levels of service, and measures the performance of the agency. Changes can include both asset and non asset solutions to provide the greatest flexibility such that the optimal solution can be selected to reduce costs and other penalties.
Design	The design process includes: design project management, TBL (triple bottom line) life cycle cost analysis, value management/engineering, input by maintenance/operations, engineering certification of designs, consideration of performance history of previous designs, and appropriate documentation. The design process is carried out by "best value" design services.
Construction	Construction is a process that consists of the building or assembling of infrastructure. Involved with the execution is the successful scheduling, budgeting, construction site safety, availability of building materials, logistics, inconvenience to the public caused by construction delays and bidding, etc.
Decommissioning	The process of removing infrastructure from service for demolition or repurpose.
Asset Management Knowledge/System	The asset management system comprises the agency asset management policy, asset management objectives, asset management strategy, asset management plans, and the activities, processes and organizational structures necessary for their development, implementation and continual improvement.

Infrastructure: Breakdown by Practice Areas

Breakdown by Practice Areas

Horizontal bar chart (practice areas, scale 0.0 to 5.0):
- Asset Commissioning: ~2.9
- Value Engineering: ~3.1
- Risk Management: ~3.3
- Replacement and Rehabilitation Forecasting: ~2.7
- Program Delivery: ~3.5
- Planning Policies and Procedures: ~3.0
- Performance Monitoring and Reporting: ~2.0
- Monitoring and Modeling: ~4.0
- Maintainability/ Operability: ~3.0
- Historical and Future Demands: ~2.9
- Design and Equipment Policies, Procedures, and Standards: ~3.7
- Contracts Administration: ~3.5
- Construction Policies, Procedures, and Standards: ~2.9
- Capital Improvement Program/Planning/ Prioritization: ~3.3
- Budgeting: ~2.6
- Asset Valuation: ~3.0
- Asset Management Plans: ~2.7
- Asset Life Cycle Costs: ~3.0
- Asset Hierarchy/…: ~4.0
- Asset Attribute Information: ~3.5
- Alternative Evaluation (BCEs): ~4.1

Subcategory Scores

	Asset Management Knowledge/ System	Construction	Design	Planning Policies and Procedures
Total	3.1	2.9	3.4	3.4

Infrastructure: Metrics

● Exceeds Target   ● Within Target Range   ● Under Target

		Metric	Formula	2012 Actuals	2012 Target	Performance	Quality	Effectiveness
INFRASTRUCTURE	Reported	Cash Reserve (Days)	Undesignated Cash Reserve Dollars/(Annual O&M Budget/365)	213.43	180.00	●	5	5
		Modeling: % of constructed system in model	• Modeling: % of system updated calibration over the last 5 years • Modeling: % of constructed system that is modeled, regularly calibrated and validated • Modeling: % of sanitary system that is modeled, regularly calibrated and validated conveyance system in model • Modeling: % of combined system that is modeled, regularly calibrated and validated	85%	93%	●	4	4
		Sanitary Sewer overflows (occurrences per 1000 miles)	Number of reported sanitary sewer overflows per 1,000 miles of pipe per year	112	Per Consent Decree	N/A	5	2
		Renewal Rate (%)	Linear feet of sewer main rehab'd or replaced/total in ft of sewer main	0.0047	0.01	●	5	2
		Sewer system effectiveness	% of reported sewer backups NOT attributable to utility	93%	90%	●	5	5
	Target Under Consideration	Failure Rate (sewer can no longer convey any flow) of collection system	100 (Total number of collection system failures during the year)/Total miles of collection system piping	0.04%	Target under consideration			

| INFRASTRUCTURE	
Average Quality Score:	4.85
Average Effectiveness Score:	3.65
Target Percentage:	
Percentage Meet or Exceeds Target	50%
Under Target:	50%

Self Assessment Results: Operations

Operations Definitions

Operations—All elements pertaining to the operation of the system, from pretreatment through disposal, as well as compliance. Includes all operational modes, such as standard and emergency conditions.

Subcategory	Definition
Operations	
Collection	The system that handles the collection of wastewater from residential, commercial, and industrial properties and conveyance to a wastewater treatment plant.
Treatment	Treatment is the process of removing contaminants from wastewater and household sewage, both runoff (effluents), domestic, commercial and institutional. It includes physical, chemical, and biological processes to remove physical, chemical and biological contaminants. Its objective is to produce an environmentally safe treated effluent and biosolids suitable for disposal or reuse.
Stormwater/Watershed	Stormwater is water that originates during precipitation events or with snowmelt which does not soak into the ground and becomes surface runoff that enters the Stormwater system. Watershed is the extent of an area of land where surface water from rain and melting snow or ice converges to a single point, usually the exit of the basin, where the waters join another water body, such as a river, lake, reservoir, estuary, wetland, sea, or ocean, and includes both the streams and rivers that convey the water as well as the land surfaces from which water drains into the channels.

Operations: Breakdown by Practice Areas

Breakdown by Practice Areas

Subcategory Scores

	Collection	Stormwater/Watershed	Treatment
Total	3.5	2.7	3.2
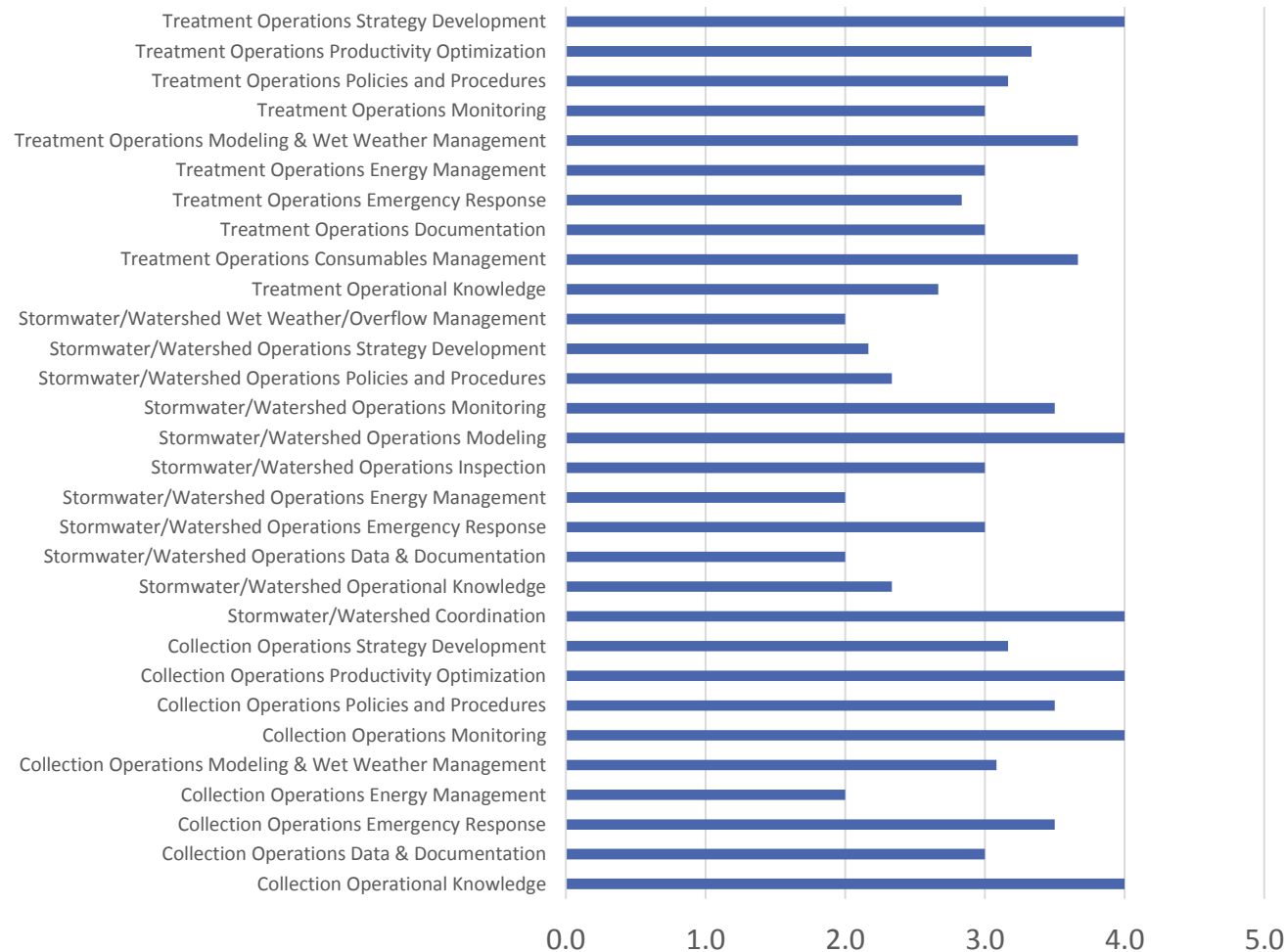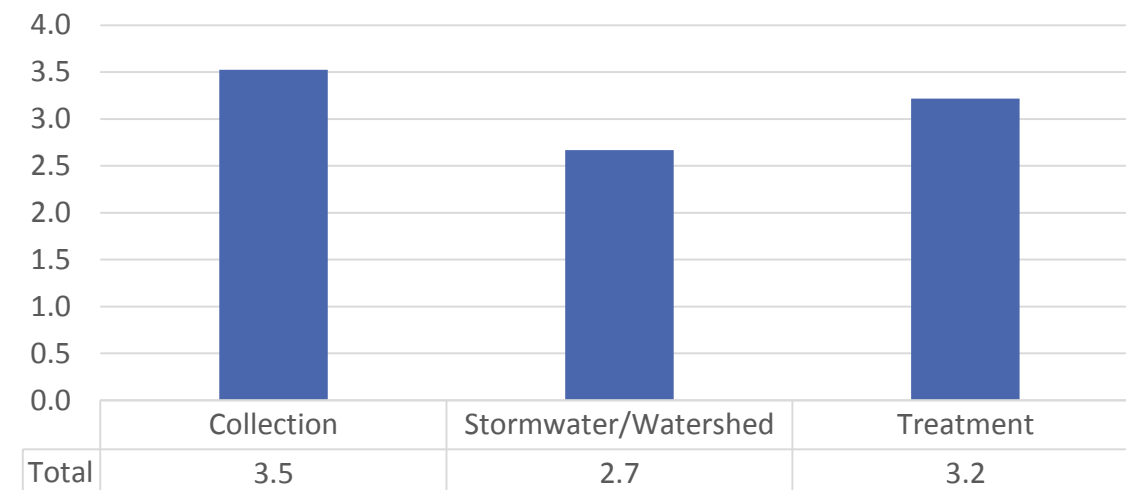
Operations: Metrics

● Exceeds Target   ● Within Target Range   ● Under Target

		Metric	Formula	2012 Actuals	2012 Target	Performance	Quality	Effectiveness
OPERATIONS	Reported	Wastewater Treatment Effectiveness Rate	100 (365 – Total number of standard non-compliance days)/365	94%	95%	●	4	4
		Field Call Responsiveness	100X (number of collection field calls responded to within 4 hours/total number of field calls during reporting period)	93%	Per Consent Decree	N/A	5	4
		Responsiveness/rapidity of response SBU	Percent of calls received and answered within a target timeframe	100%	Per Consent Decree	N/A	5	5
	Target Under Consideration	Call Abandonment	Number of calls abandoned per period/number of calls received	6%	Target under consideration	●		
		Sewer System Disruption per 1000 Customers	(1000) Number of Customers Experiencing Disruptions due to MSD infrastructure/Number of active customer accounts	2%	Target under consideration	●		

OPERATIONS	
Average Quality Score:	4.60
Average Effectiveness Score:	4.30
Reported Target Percentage:	
Percentage Meet or Exceeds Target	100%
Under Target:	0%

Self Assessment Results: Maintenance

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Maintenance Definitions

**Maintenance—**All elements pertaining to the maintenance of the system, from pretreatment through disposal.

Subcategory	Definition
Maintenance	
Collection	The system that handles the collection of wastewater from residential, commercial, and industrial properties and conveyance to a wastewater treatment plant.
Treatment	Treatment is the process of removing contaminants from wastewater and household sewage, runoff (effluents), domestic, commercial and institutional sources. It includes physical, chemical, and biological processes to remove physical, chemical and biological contaminants. Its objective is to produce an environmentally safe treated effluent and biosolids suitable for disposal or reuse, which also meets service level or regulatory requirements.
Stormwater/Watershed	Stormwater is water that originates during precipitation events or with snowmelt which does not soak into the ground and becomes surface runoff that enters the stormwater system. Watershed is the extent of an area of land where surface water from rain and melting snow or ice converges to a single point, usually the exit of the basin, where the waters join another water body, such as a river, lake, reservoir, estuary, wetland, sea, or ocean, and includes both the streams and rivers that convey the water as well as the land surfaces from which water drains into the channels.

Maintenance: Subcategory Scores

Breakdown by Practice Areas

Subcategory Scores

Total	Collection	Stormwater/Watershed	Treatment
	3.7	2.3	4.1
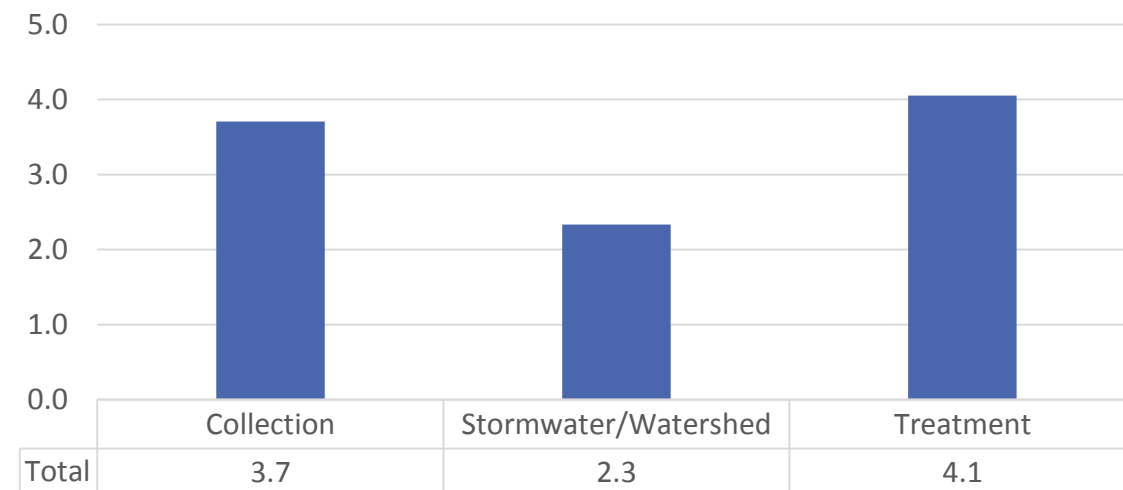
Maintenance: Metrics

● Exceeds Target   ● Within Target Range   ● Under Target

		Metric	Formula	2012 Actuals	Target	Performance	Quality	Effectiveness
MAINTENANCE	Reported	Planned Maintenance Ratio in Percent (Hours)	(100) Hours of Planned Maintenance/Hours of Planned + Corrective Maintenance	55%	80%	●	2	2
		Plant Availability (Maintenance)	Mean time between failure/(mean time between failure + mean time to restore)	99.8%	100%	●	2	2
		Plant Maintainability (MTTR - Days)	Mean time to restore a failure	7.12	7	●	2	2
		Plant Reliability (MTBF - Years)	Total time/failures	8.12	9	●	2	2
		Sewer cleaning	Percent of sewers cleaned each year	1%	2%	●	2	4
		Sewer inspections	Linear feet of sewer lines televised each year divided by total linear feet of sewer lines	8%	10%	●	2	4
		Maintenance holes inspected	Percent of maintenance holes inspected per year	2%	2%	●	2	4

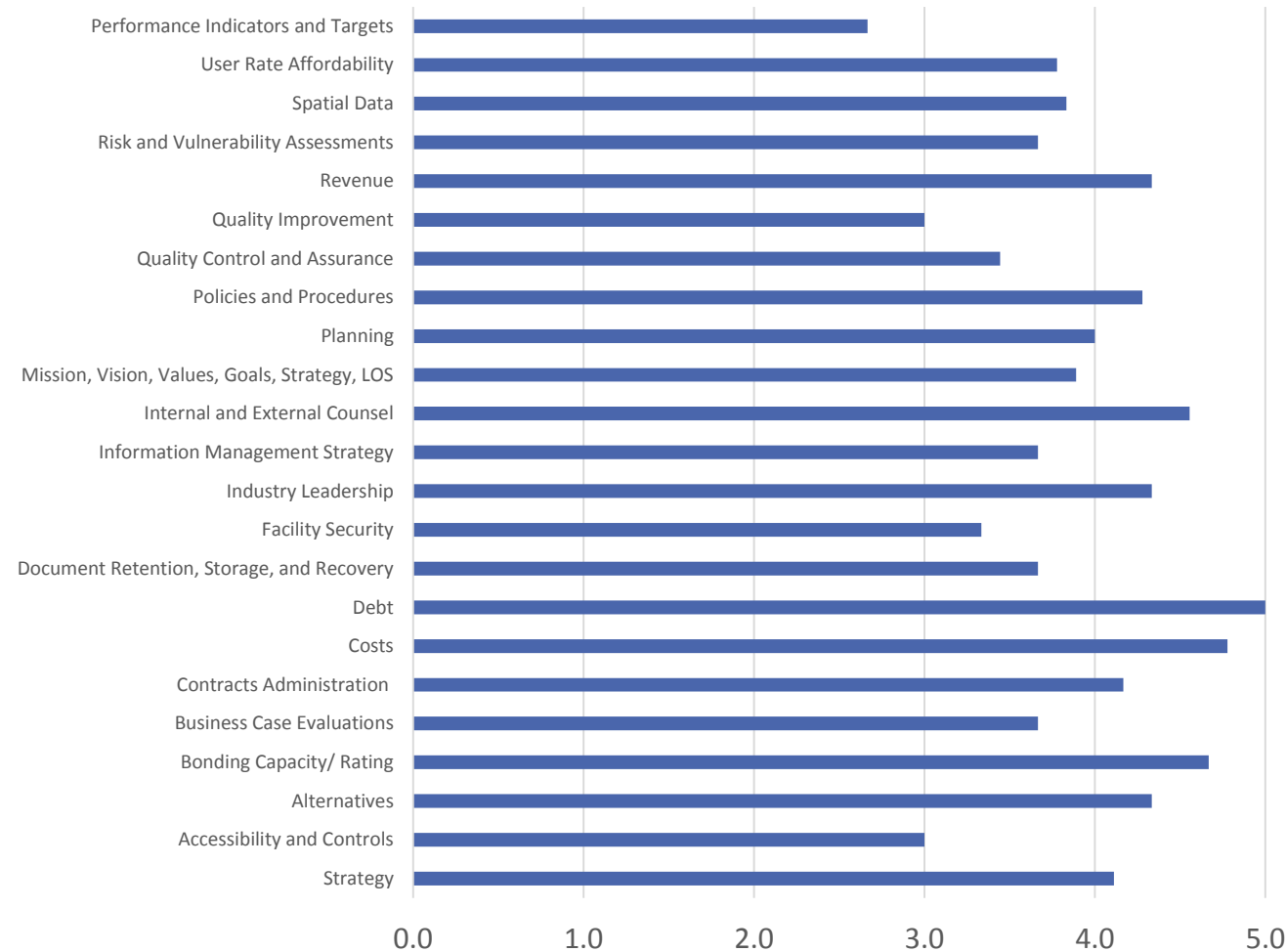| MAINTENANCE	
Average Quality Score:	1.43
Average Effectiveness Score:	2.28
Target Percentage:	
Percentage Meet or Exceeds Target	86%
Under Target:	17%

Self Assessment Results: Organization

Organization Definitions

Organization—All elements pertaining to the functions and processes of the utility.
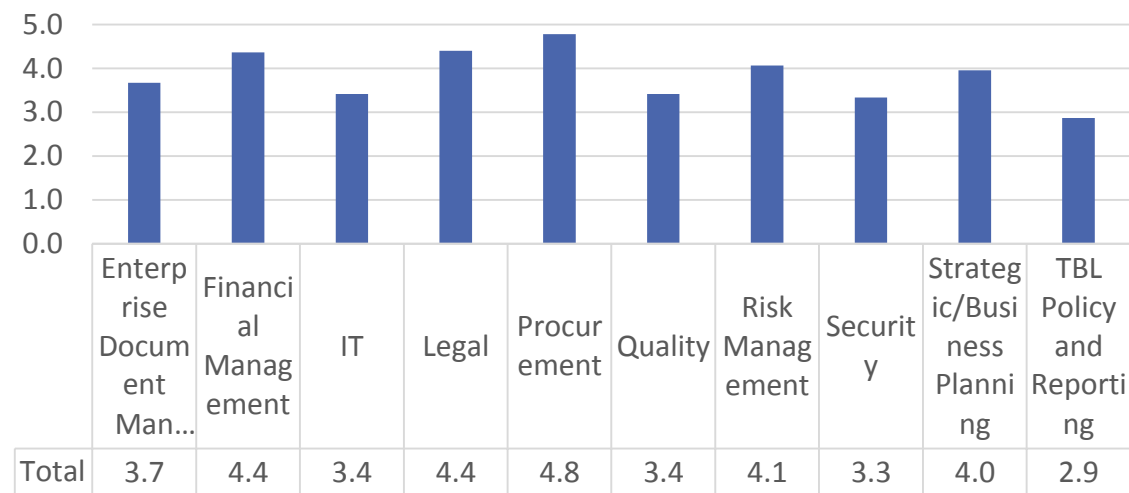
Subcategory	Definition
Organization	
Financial Management	Managing the full life-cycle cost of the agency and establishing and maintaining an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. Establishes predictable rates—consistent with community expectations and acceptability—adequate to recover costs, provide for reserves, maintain support from bond rating agencies, and plan and invest for future needs.
Risk Management	Risk management covers all the activities involved in identifying and management of risks, including establishment of the risk policy and business context, identification of risk, quantification of the likelihood and consequence of failure or of loss events, evaluation of the risk, prioritize mitigation for best value, implementation of mitigation, and risk monitoring.
Strategic/Business Planning	Strategic planning is an agency's process of defining its strategy and making decisions on allocating its resources to pursue this strategy. Generally, strategic planning deals with at least one of three key questions: "What do we do?", "Why do we do it?""For whom do we do it?", and "How do we excel?". This is the process for determining where an agency is going over the next year or 3 to 5 years.
Legal	System of rules and guidelines that an agency must follow that are enforced through institutions.
Quality	Quality management system standards.
TBL Policy and Reporting	Approach for an expanded spectrum of values and criteria for measuring agency (and societal) success: economic, ecological, and social.
Enterprise Document Management	System used by an agency to track and store electronic documents by keeping track of the different versions modified by different users (history tracking). Allows publishing, editing and modifying content from a central interface and manages workflow in a collaborative environment.
Security	Security is the degree of protection to safeguard against danger, damage, loss, and crime. Security as a form of protection are structures and processes that provide or improve security as a condition.
IT	Information technology infrastructure and existing software support the storage and delivery of information. An agency employs a wide array of software products that should collectively store – or be able to store – the core information needed to support asset management decision-making in a timely manner.
Procurement	Purchasing refers to an agency attempting to acquiring goods or services to accomplish its goals.

Organization: Breakdown by Practice Areas

Breakdown by Practice Areas

Horizontal bar chart showing practice area scores (0.0 to 5.0):
- Performance Indicators and Targets
- User Rate Affordability
- Spatial Data
- Risk and Vulnerability Assessments
- Revenue
- Quality Improvement
- Quality Control and Assurance
- Policies and Procedures
- Planning
- Mission, Vision, Values, Goals, Strategy, LOS
- Internal and External Counsel
- Information Management Strategy
- Industry Leadership
- Facility Security
- Document Retention, Storage, and Recovery
- Debt
- Costs
- Contracts Administration
- Business Case Evaluations
- Bonding Capacity/ Rating
- Alternatives
- Accessibility and Controls
- Strategy

Subcategory Scores

	Enterprise Document Man...	Financial Management	IT	Legal	Procurement	Quality	Risk Management	Security	Strategic/Business Planning	TBL Policy and Reporting
Total	3.7	4.4	3.4	4.4	4.8	3.4	4.1	3.3	4.0	2.9

Organization: Metrics

● Exceeds Target   ● Within Target Range   ● Under Target

		Metric	Formula	2012 Actuals	2012 Target	Performance	Quality	Effectiveness
ORGANIZATION	Reported	Bond rating	Per Insurance/Annual	AA+	AA+	●	5	5
		Debt Service Coverage ratio	Operating net income/Debt Service	1.87	1.50	●	5	5
		Debt Coverage with Beginning Balance	(Net Income + Cash Reserve Beginning Balance excess of 90 days)/Debt Service	3.46	2.00	●	5	5
		Capital Project Execution	Percent of capital investment projects started and completed on time and on budget (according to a capital improvement plan)	85%	85%	●	4	4
		Budget: % accomplished (all projects)	$ spent / Total budget	92%	80%	●	5	5
		Budget: % accomplished (Project 1 [each consent decree project])	$ spent / Total project budget	56%	Per Consent Decree	N/A	5	4
		Schedule: % of projects on schedule	[No. of projects on schedule/ Total No. of projects	100%	80%	●	5	5
		Schedule: % complete per project	No. of days complete into project / Project duration	78%	Per Consent Decree	N/A	5	5
		No. of available float days per project milestone	l Planning l Design l Construction	23% PTI; 29% start; 48% Finish	Per Consent Decree Schedule	N/A	5	5
		Total spend on Small Business Enterprise (SBE), Minority-owned Business Enterprises (MEBE), and/or Women-owned Business Enterprises (WEBE)	SBE+MEBE+WEBE/total spend	18.4%	20%	●	5	5
		SBE spend on construction	SBE construction spend/total construction spend	19.8%	30%	●	5	5
		SBE spend on professional services	SBE professional services spend/total professional spend	21.7%	10%	●	5	5
		SBE spend on services & supplies	SBE services & supplies spend/total services and supplies spend	7.8%	15%	●	5	5
	Target Under Consideration	Cost per million gallons produced / treated	O&M expenses (e.g., chemical, power, labor and/or total cost) per million gallons produced and delivered	$2,099	Target under consideration			
		Rates	Average monthly residential customer bill	$63	Target under consideration			
		Average usage per customer	Average monthly usage per residential customer in gallons	5440.2 gallons	Target under consideration			
		Delinquencies	Percent of delinquent bills/national average delinquency rates % customers >30 days delinquent	Baselining	Target under consideration			

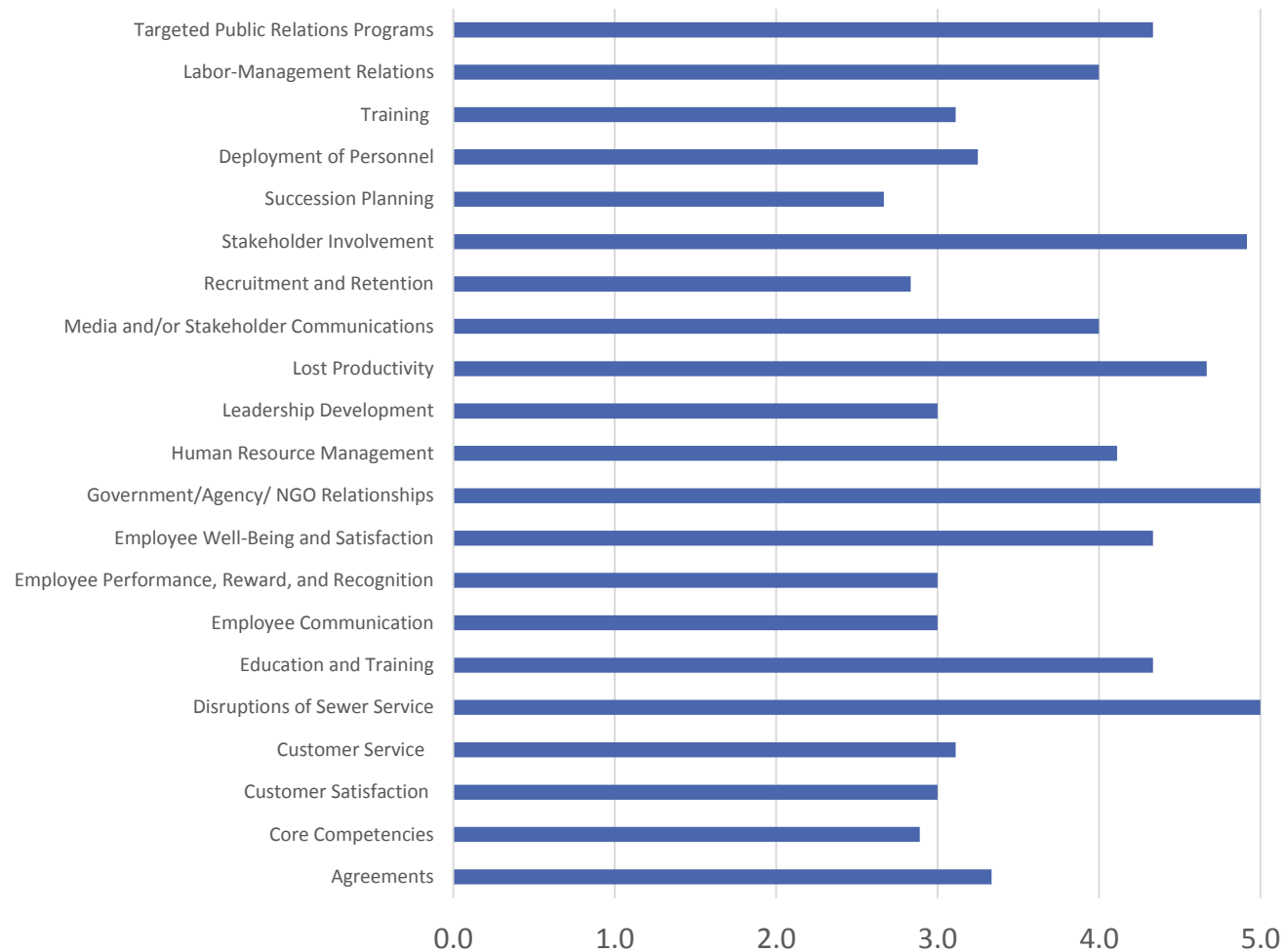| ORGANIZATION	
Average Quality Score:	4.92
Average Effectiveness Score:	4.85
Reported Target Percentage:	
Percentage Meet or Exceeds Target	80%
Under Target:	20%

Self Assessment Results: People

People Definitions

People—All elements pertaining to people interacting with a utility including employees, customers, and stakeholders.
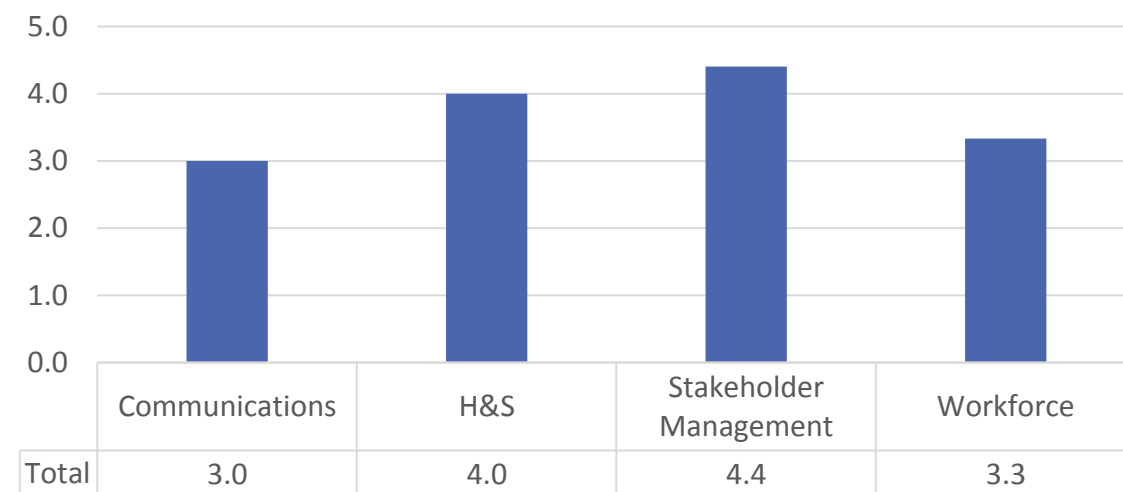
Subcategory	Definition
People	
Workforce	Workforce includes the following elements: staff skills, training & performance management, staff succession and recruitment planning, staff surveys, feedback and improvement, workplace legislation, safety, standards and agreement compliance, and managing organizational change.
Health and Safety	Cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goals of occupational safety and health programs include fostering a safe and healthy work environment.
Stakeholder Management	Stakeholder management supports an agency's strategic objectives by interpreting and influencing both the external and internal environments and by creating positive relationships with stakeholders through the appropriate management of their expectations, levels of service, and agreed objectives. Stakeholder management prepares a strategy utilizing information gathered during the following common processes: stakeholder identification, stakeholder analysis, stakeholder matrix, stakeholder engagement, and communicating information.
Communications	Process by which information is transmitted to internal and external parties.

People: Breakdown by Practice Areas

Breakdown by Practice Areas

Targeted Public Relations Programs
Labor-Management Relations
Training
Deployment of Personnel
Succession Planning
Stakeholder Involvement
Recruitment and Retention
Media and/or Stakeholder Communications
Lost Productivity
Leadership Development
Human Resource Management
Government/Agency/ NGO Relationships
Employee Well-Being and Satisfaction
Employee Performance, Reward, and Recognition
Employee Communication
Education and Training
Disruptions of Sewer Service
Customer Service
Customer Satisfaction
Core Competencies
Agreements

Subcategory Scores

	Communications	H&S	Stakeholder Management	Workforce
Total	3.0	4.0	4.4	3.3

People: Metrics

● Exceeds Target   ● Within Target Range   ● Under Target

		Metric	Formula	2012 Actuals	2012 Target	Performance	Quality	Effectiveness
PEOPLE	Reported	Employee Preventable Accidents/Injuries	(# of accidents and recordable incidents-Injuries per year) / (Total # of hours worked)x200,000	3.39	0	●	2	3
		Number of customers/stakeholders attending community outreach meetings and events	Average number of attendees divided by population served number	1500	3000	●	4	4
		Overall customer satisfaction with Service Request Process	Percent of customers rating overall service request process response as "Acceptable" or better (through a representative sample customer service survey)	84%	80%	●	2	3
		Safety training	Average hours of safety-related training per employee per year	6.4	8	●	5	4
		Staff training and education - Average hours of training per year per employee	Total training hours/ total employee count	21.5	40	●	5	4
		Union grievances	Number of union grievances filed	19	17	●	5	4
		Required Consent Decree Projects: % complete	No. of Phase 1 projects complete into Phase 1 / Total number Phase 1 projects	77.6%	Per Consent Decree	N/A	5	5
		Employee Health and Safety Incident Rate	Total # of injuries & illnesses X 200,000/Total hours worked by all employees	6.77	0	●	5	2
	Target under Consideration	Customer Service Complaints	1,000X (customer service associated complaints/number of active customer accounts)	Baselining	Target under consideration			
		Customer complaints- number of customer complaints recorded	1,000X (customer service associated complaints/number of active customer accounts)	Baselining	Target under consideration			

PEOPLE	
Average Quality Score:	3.62
Average Effectiveness Score:	3.62
Reported Target Percentage:	
Percentage Meet or Exceeds Target	29%
Under Target:	71%

Self Assessment Results: Environmental

METROPOLITAN
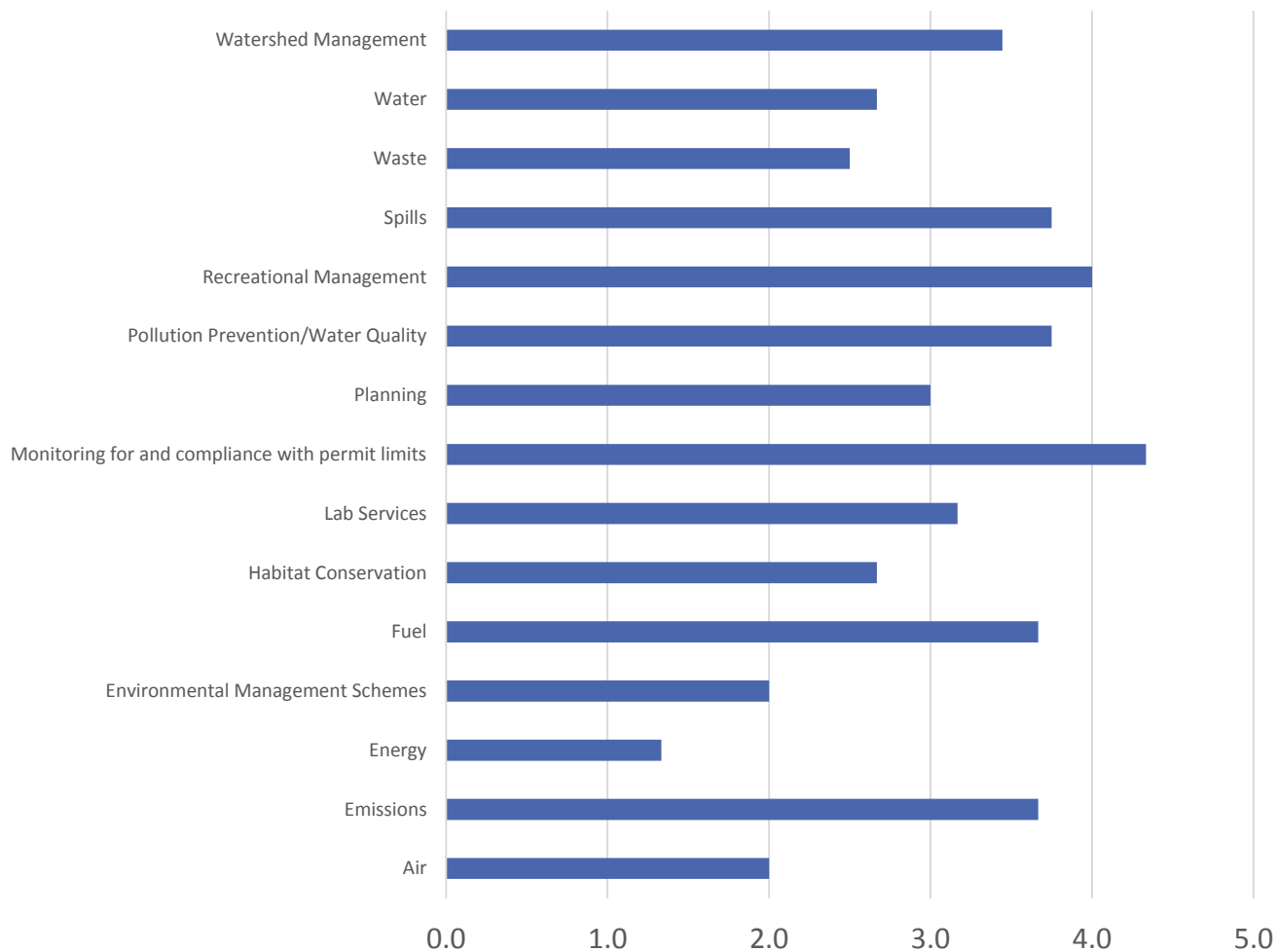SEWER DISTRICT
of greater
CINCINNATI

Environmental Definitions

> **Environment**—All elements pertaining to the natural environment and its interactions including living and non-living things occurring naturally including all vegetation, microorganisms, soil, rocks, air, water, climate, energy, etc.
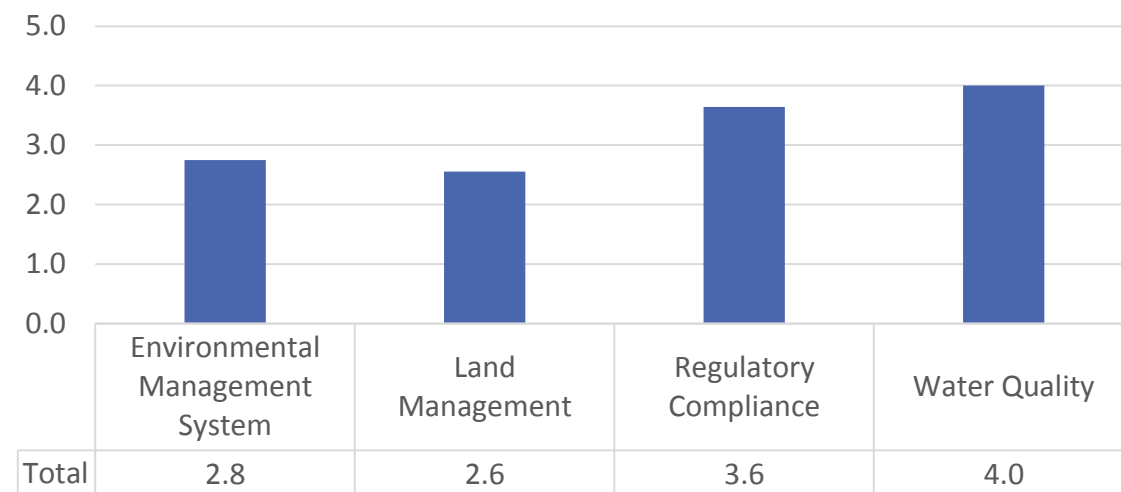
Subcategory	Definition
Environment	
Regulatory Compliance	Regulatory compliance describes the means of conforming to a rule, such as a consent decree, specification, policy, standard, permit, or law that utilities must meet.
Water Quality	Statutory and discretionary monitoring, modeling and reporting of water quality in terms of physic/biological, chemical and aesthetic parameters.
Land Management	Management of the use and development in both urban and rural settings of land resources used for a variety of purposes which may include habitat management, organic agriculture, reforestation, water resource management and eco-tourism projects.
Environmental Management System	Management of an organization's environmental programs in a comprehensive, systematic, planned and documented manner. It includes the organizational structure, planning and resources for developing, implementing and maintaining policy for environmental protection. Serves as a tool to improve environmental performance and provides a systematic way of managing an organization's environmental affairs. It may be the aspect of the organization's overall management structure that addresses immediate and long-term impacts of its products, services and processes on the environment. Gives order and consistency for organizations to address environmental concerns through the allocation of resources, assignment of responsibility and ongoing evaluation of practices, procedures and processes and focuses on continual improvement of the system.

Environment: Breakdown by Practice Areas

Breakdown by Practice Areas

Horizontal bar chart showing approximate scores (0.0–5.0):
- Watershed Management: ~3.5
- Water: ~2.6
- Waste: ~2.5
- Spills: ~3.7
- Recreational Management: ~4.0
- Pollution Prevention/Water Quality: ~3.7
- Planning: ~3.0
- Monitoring for and compliance with permit limits: ~4.3
- Lab Services: ~3.2
- Habitat Conservation: ~2.6
- Fuel: ~3.6
- Environmental Management Schemes: ~2.0
- Energy: ~1.3
- Emissions: ~3.6
- Air: ~2.0

Subcategory Scores

	Environmental Management System	Land Management	Regulatory Compliance	Water Quality
Total	2.8	2.6	3.6	4.0

Environmental: Metrics

● Exceeds Target   ● Within Target Range   ● Under Target

		Metric	Formula	2012 Actuals	Target	Performance	Quality	Effectiveness
ENVIRONMENT	Reported	Energy Consumption Efficiency (kWh/MG)	Direct energy consumed to collect and treat wastewater (kWh)/Volume of wastewater collected and treated (MG)	1908	1900	●	5	2
		Percent compliance with NPDES permit	Number of NPDES permit exceedances/Total number of possible NPDES permit exceedances	99.9%	100%	●	5	4
		Percent compliance with Title V permit	(Number of Title V permit exceedances)/(Total number of possible Title V permit exceedances)	98%	100%	●	5	4

ENVIRONMENT	
Average Quality Score:	5.0
Average Effectiveness Score:	3.33
Target Percentage:	
Percentage Meet or Exceeds Target	100%
Under Target:	0%

Findings & Next Steps

METROPOLITAN
SEWER DISTRICT
of greater
CINCINNATI

Summary of Practice Findings

METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Practice Averages					
Average Practice Score	3.65	Average Application Score	3.26	Average Effectiveness Score	3.26	Under Target	35%

MSD Self Assessment: Practices

	Environment	Infrastructure	Maintenance	Operations	Organization	People
Total	3.4	3.2	3.3	3.1	3.9	3.8
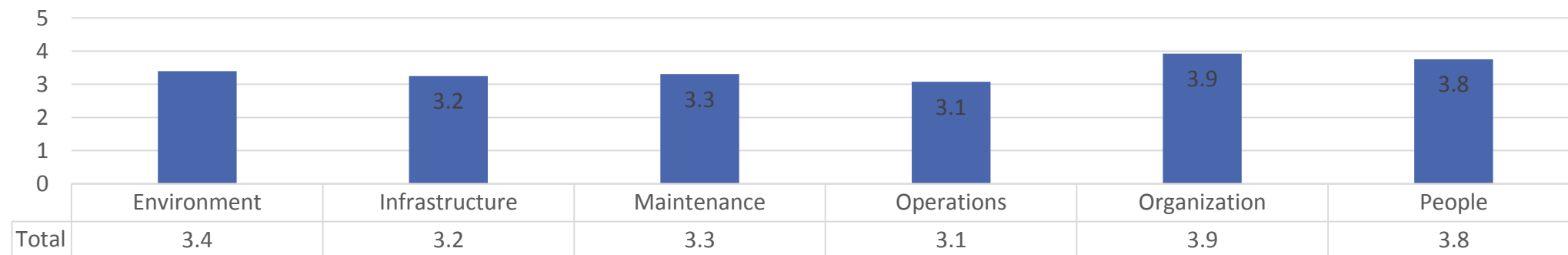
In mid-2013, MSD completed this self assessment utilizing practices and metrics that are relevant to consider performance and compliance of Consent Decree requirements.

6 Categories
   28 Sub-categories
109 Practice areas
   more than 250 measures

Practice Averages

Metric Breakdown					
Environmental		**Infrastructure**		**Maintenance**	
Average Quality Score:	4.75	Average Quality Score:	4.85	Average Quality Score:	2.00
Average Effectiveness Score:	3.5	Average Effectiveness Score:	3.65	Average Effectiveness Score:	2.85
Target Percentage:		Target Percentage:		Target Percentage:	
Percentage Meet or Exceeds Target:	75%	Percentage Meet or Exceeds Target:	50%	Percentage Meet or Exceeds Target:	86%
Under Target:	25%	Under Target:	50%	Under Target:	17%
Operations		**Organization**		**People**	
Average Quality Score:	4.60	Average Quality Score:	4.92	Average Quality Score:	4.10
Average Effectiveness Score:	4.30	Average Effectiveness Score:	4.85	Average Effectiveness Score:	3.66
Target Percentage:		**Target Percentage:**		**Target Percentage:**	
Percentage Meet or Exceeds Target:	100%	Percentage Meet or Exceeds Target:	80%	Percentage Meet or Exceeds Target:	29%
Under Target:	0%	Under Target:	20%	Under Target:	71%

Next Steps

MSD anticipates conducting the benchmarking assessments in future years. Additionally, MSD is reaching out to assemble industry input on the assessment tool including but not limited to WERF and EPA.